ISSN: 0067-2904

Engineering of An Innovative Oral Scientific Communication Device: Case of the Doctoral Training Context

Soufiane Zerraf [1*], Mustapha Bassiri [2], Siham Zain [3], MalikaTridane[4], Said Belaaouad[5]
[1] Faculty of Sciences Ben M'Sick. Hassan II University of Casablanca, Casablanca, Morocco
[2]Laboratory of Education and Training Sciences. Normal Superior School (ENS), Hassan II University, Casablanca. Morocco.
[3]Groupe interdisciplinaire des didactiques des sciences et Science d'éducation ENS UH2C
4Centre Régional des métiers d'enseignement et de formation Casablanca, Maroc.
[5]Faculty of Sciences Ben M'Sick. Hassan II University of Casablanca, Casablanca, Morocco,

Abstract:
The use of a communication network in the closed loop control systems has many advantages such as remotely controlling equipment, low cost, easy to maintenance, efficient information transmission, etc. However, the Networked Control System (NCS) has many drawbacks, such as network-induce end-to-end time delay and packet loss, which lead to significant degradation in controller performance and may result in instability. Aiming at solving performance degradation in NCS, this paper propose to take the advantages and strength of the conventional Proportional-Integral-Derivative (PID), Fuzzy Logic (FL), and Gain Scheduling (GS) fundamentals to design a Fuzzy-PID like-Gain Scheduling (F-PID-GS) control technique, which has been proved to be effective in obtaining better performance. The True Time toolbox is used to establish the simulation model of the NCS. Ethernet as a communication network is simulated for different load conditions and random packet loss. The design approach is tested on a second order stepper motor. The results obtained show the effectiveness of the proposed approach in improving the overall system performance.

Keywords: engineering- oral scientific communication- innovative – device-context.

Introduction:

Scientific communication refers to all works of dissemination of theories and scientific results. Scientific communication can take the form of articles, books, presentations (papers) in colloquium or congress, posters ... [1].

The challenge is both in the form of drafting expected, as in the knowledge of networks and circuits to publish its productions, the objective being to bring its stone to the scientific edifice but also to be cited, to be published in high-impact factor reviews ... all things that matter in the evaluation.

Oral communication at a scientific congress or professional conference is often the first opportunity to disseminate these results to their potential users.

Oral communication has many features that written communication has not. Two interesting features are, on the one hand, that the audience is captive (the listeners are "prisoners" in the room where we present) and, on the other hand, that the first presentation seems more original. The publication of an article occurs most often after the results have been presented at a congress [2].

The road to good oral communication is marked by many obstacles, which explains why this activity

*Email: soufiane.zerraf@gamil.com

is considered difficult by most of our colleagues. The difficulty most immediately perceived is that the time of presentation which is imposed on us is limited, or even very limited. Thus, the typical communication in scientific congresses lasts only ten minutes [3].
In fact, we must learn to respect some principles whose description is the subject of this article. More precisely, in this article, we define the main principles guaranteeing a quality oral presentation, we describe the stages of preparation of an oral communication in a congress and we provide some practical guidelines to control the conditions of communication**.**

1. WORKING HYPOTHESES

Our research study aims at verifying the central hypothesis: how to improve the skills of oral expression for argumentative purposes in oral presentations at the symposium among young scientific researchers of FSBM (Faculty of Sciences Ben M'sik Casablanca)? Several sub-hypotheses have been developed, allowing the doctoral training management team to set up a learning unit that meets the expectations and needs of the students. These working hypotheses were based on both direct and indirect observation (inferred from the analysis of the performances of video recordings of scientific conferences).

The Faculty of Sciences Ben M'sik Casablanca contains 697 doctoral students divided according to their specialities:

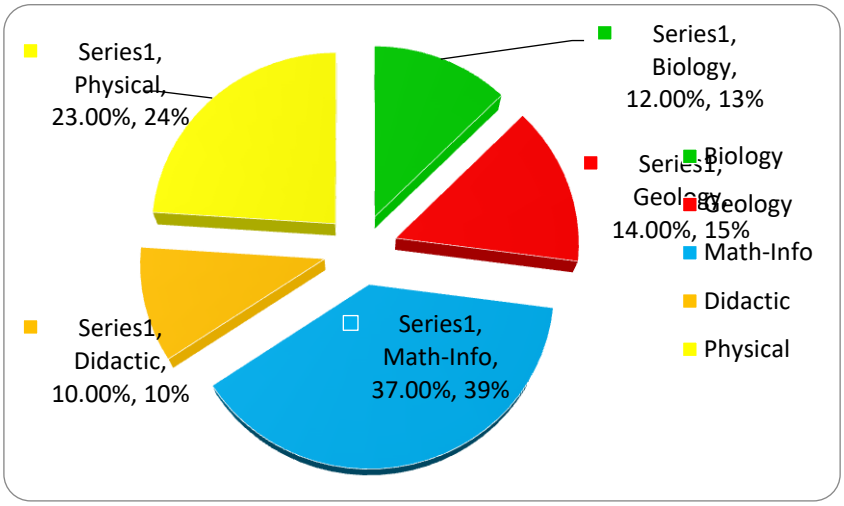

Figure 1-Doctoral students divided according to their specialties

As part of the transversal training of doctoral students. We have carried out an action research project with the objective of designing and writing a teaching aid for communicative knowledge that enables doctoral students of the Ben M'sik Faculty of Sciences to improve their oral communication skills in international conferences. This approach should take into account the analysis of the behaviour observed, the specificities of the doctoral students and the training objectives.
We carried out a qualitative and interpretative research on the observation of doctoral students in real situations of oral communication in the international symposiums, interviews and analysis of their respective video recordings. This research would try to highlight a device for evaluating oral communication in order to incrementally and continuously improve communication techniques and skills, according to the Japanese system "Kaizen", while maintaining a minimum of stress while keeping the project of oral communication in its persuasive and argumentative virtues.
We were able to model certain variables that impede the quality of scientific communication. Data from the investigation analysis are categorized:

1. **Exogenous variable**: Form "linear and confusing presentation mode" and "descriptive content" content: concepts used imprecise, the object constructed ill-defined and the method implemented and the results provided are poorly articulated.

2. **Endogenous factor:** Linked to the personality of the facilitator: difficulty of communication before and in a group: reading slides, often tedious / overwhelmed by personal feelings during the critical debate.

3. **Background Factor**: And the subject of the call for papers: The interview conducted with the doctoral students shows a lack of in-depth analysis of the specificity of the audience and the context.

4. **Technological factor**: and the communication management strategy: Lack of a clear and explicit communication plan (preliminary phase).

5. **Information-related factor**: knowledge to be communicated in a communication context to a public of specialists or to a wider audience or to explain the results at a multidisciplinary seminar or to discuss the work in progress.

6. **Variable relating to the relation to knowledge:** To demonstrate an attitude of vulnerability in the presence of specialists in its field of research.

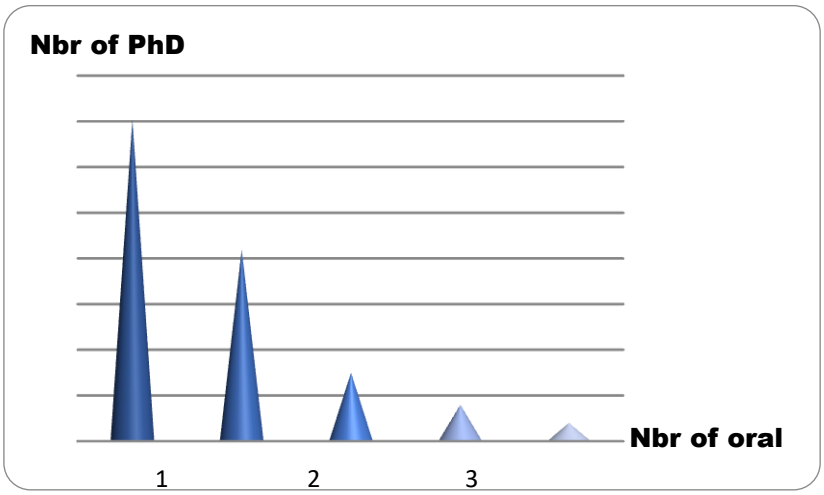

Figure 2-Number of PhD students based on number of participants per oral communication

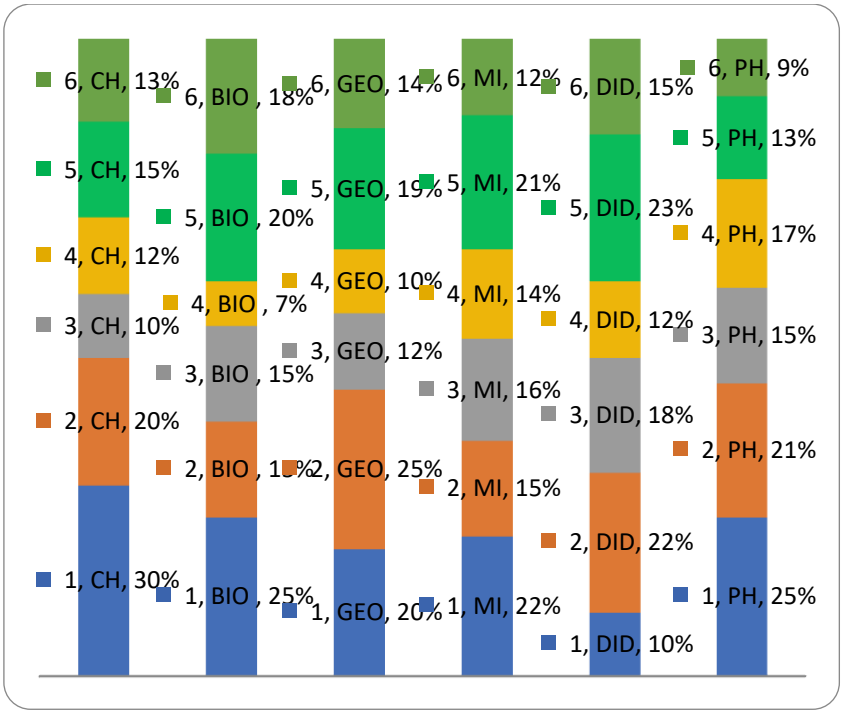

Figure 3-Percentage of variables that impede the quality of scientific communication in each specialty

Endogenous factor Endogenous Factor Factor linked to Context Factor related to technique Information Factor Variable related to the relationship to knowledge

2. PREPARATION OF A SCIENTIFIC ORAL COMMUNICATION

1. The different types of presentations [4]

Those that you will be led to practice in master:

- 1. Analysis of a scientific article (15-20 min)
- 2. Presentation of your research work (15-20 min)

The lecture-type lecture (eg the day of your thesis) lasts about 45 minutes. It may be considered as an extension of the Type 2 submission.

The two types of presentations follow common principles for their preparation and execution, but also have their own specificities.

2. Préparation of a good presentation

- What should he prove?
- What are its objectives?
- What are the means used to prepare a presentation?
- Visual support and oral discourse
- What are the pitfalls to avoid?
- What are the tricks of the old briscards?
- How will your presentation be assessed?

A good presentation must meet three essential tasks:

- Communicating scientific facts and the corresponding arguments
- Convince the audience that both are fair
- Be scientifically interesting and engage the attention of the audience

At the level of the content, it must provide relevant answers to the 3 questions:

"What? Why? How? "

A good presentation makes it possible to highlight:

• It allows, in particular,

- The ability to present scientific results in a relevant and educational manner.
- Personal (scientific) reflection.
- Critical thinking.

- ➢ The ability to force interest and attention.
- ➢ Managing stress.

3. Communication objectives to be answered by the presentation

3.1. General

- Make a clear and memorable message:
- ✓ Using an appropriate oral discourse (relevant, precise, lively)
- ✓ And appropriate iconography
- Convince the audience of your scientific and pedagogical value

3.2. Specific

Techniques: for example, you have developed a new technique that can be widely used: let us know!

Scientists: you have achieved quite innovative results (bravo!). The audience who is probably not a specialist should be able to appreciate the interest and the scope (=> context, novelty description and open perspectives)

Other: eg: your practical master placement did not work (negative results). You have to convince the audience that you are a good scientist...

4. Information and documentation

1. Identify the main sources of documentation (articles cited in the bibliography, database, web ...).
2. Systematically search for information related to communication objectives ... then go to item 3
3. Process information according to their:

- Relevance
- Credibility
- Usefulness for the presentation
- Etc.

4. Choosing the definitive information: Exposing is choosing!

5. The preparation of the support

Choosing the appearance of the slides (Style) [4]:

- Set a template for all slides (background color, color and size of text, graphics).
- Automate style (mask under Power point, stylesheets, document templates, ...)
- Size of the font (Title: 36-44, Subtitle: 28-, Text: 24-18 points)
- Max 3-4 colors per slide
- Pages must be in landscape format

The 7 rules of lead to misuse a visual medium (Grenier et Bérard, 2002) [5]	**Use visual aids as simple decorations or stun the audience by a" fireworks" of arrows and colors**
Use too many visual elements whose contents you will read in full	**Use them at the wrong time, and between two elements, let the projector glow blind the audience**
Use poorly reproduced figures and data written with fancy or tiny font	**Display each visual aid for ten minutes**
Use poorly reproduced figures and data written with fancy or tiny font	**Display each visual aid for ten minutes**
Fragment the information to make it incomprehensible or, better, compress an infinite amount of information on a single visual aid	**Display your visual aids for a fraction of a second and without reference in your communication**

6. Practice giving a presentation [6]

Why ?

Only a repetition makes it possible to judge the relevance of choices (number, interest, sequence of slides, quality of comments, ...) and the degree of preparedness reached.

How?

ALONE: mentally, in front of a mirror, with a tape recorder, in front of a video camera

• Advantages: essential to adjust the presentation (duration, sequences, etc.)

• Disadvantages: one is bad judge of his faults

In front of an assistance

• Advantages: situation closer to reality, interactivity, more objective judgment, training in questions.

How many times ?

•Many!!

3. A FEW TIPS

The best way to grasp a presentation is through preparation and relaxation.

On the day of your presentation, arrive before time in order to tame the premises, technologies and ensure that the practical aspects are under control. Talk to people. Have a coffee or water. You can even go to the outside of the building if you have the time.

Take the time to settle down. Gently lay down your sheets or turn on your computer and multimedia projector. Check that the equipment is working properly and is ready for operation. If necessary, adjust the microphone.

A few minutes before speaking, tap into your motivation and focus on what you have to say. Is it time to dive? Take a few deep breaths and move forward with confidence.

Always begin by introducing yourself: who you are, where you come from and then tell the audience that it is nice for you to introduce your work to them. Also, thank the organizers of the event. These simple phrases will help you to soothe the shock of the beginning of the presentation.

If you feel uncomfortable just before your presentation, remember these simple words:

- I am well prepared for this presentation.
- I am an expert, I am the best person in this room to convey what I am about to say.
- I have control.

Now you have just concluded, but your presentation is not over. Not quite, you still have to survive the question period [5].

Questions are normally reserved for the end of the presentation. They usually occupy 5 to 15 minutes and are usually apprehended with fear. This is a shame since the question period allows you to receive feedback on your presentation and may even provide you with interesting ideas for the future.

4. CONCLUSION

At the end of this analysis, we can conclude that oral scientific communication is an essential lever for the valorization of scientific research. From the heuristic methodology of design and presentation of objects of oral communication emerges the real value of the scientific content to be affirmed or confirmed.

It is obviously difficult to analyze this oral presentation in its multifactorial aspects. The quality and relevance of the oral presentation is basically determined by the variables of the form, the background "Knowledge and analyzers of argument", the presentation technique "time management, supports ..." and the capacity to communicate in front of and in a group (attitude and posture of the communicator). As a result, reflection on the main functions of oral presentation in scientific discourse constitutes a powerful vector for validating the relevance of a particular research work. This study of descriptive and exploratory research also tackled another epistemological and heuristic dimension according to the expression of Van Campenhoudt who affirmed that "the ultimate criterion of the validity of the research work is indeed the inter subjectivity in the scientific community".

The purpose of this paper is to provide a brief overview of the basic principles of the object and approach of oral communication, the Principles of structural and organizational efficiencies of affirmed and confirmed results that are sought to be known and convinced. This is why we defend the idea that the formalization and standardization of rules for the scientific validation of oral communications is part of a continuing improvement in the quality of clear and precise oral

presentations. The stakes of this continuous improvement can only be justified by the contribution of the demand for attention and rigor and should be expressed in all university training courses and in all final projects.

Therefore, we ask for the choice of the criteria for evaluating the performance of the oral communication respecting the variables: relevance, independence, validity and reliability in order to hope to rationalize the meaning of the content and the management of the potential disturbance factors of Communication (stress, uncertainty, conference venue, etc.). Thus the research logic should prevail over an oral animation logic which should respect two conditions sine qua non:

∗ The contextualization of the indicators of argumentation (Corpus of knowledge) by harmonizing it properly with a methodology of rigorous and coherent argumentation.

∗ The provocation of an epistemological reflection on the scientific knowledge built on the basis of an intelligibility of communication.

It follows that scientific oral communication is a "core" of the research work and constitutes a decisive step in the process of scientific advancement and validation. Consequently, the technical-pedagogical and managerial questions linked to oral scientific communication are of great importance within the international scientific community.

Oral scientific communication should be analyzed not only as an end in itself but as a means of action, of expression in the face of the scientific community, of exchange, sharing of experience, verbalization of constraints and weaknesses of objects and of research approach in order to overcome them through a reflexive feedback-based approach and inter-community scientific collaboration. The key standards of the oral presentation should be the subject of a didactic preparation of conscientious intervention so that the audience can identify and understand the stakes of scientific communication. The objects of argumentation, methodology and results provided should be clearly congruent and original.

In other words, it should be borne in mind that scientific communication is part of a process of interpersonal exchange and transfer of intent. This implies careful consideration of the context and issues involved in communication. Target population analysis: Who is it for? The content will be varied and diverse depending on the audience "audience of specialists or public broader and less enlightened on the subject. What is the fundamental and priority objective? Is it a matter of describing or explaining or arguing the results or discussing the work being done, highlighting the methodology advocated and anticipating possible outcomes? The "vulnerability" of the research would be more complex and vague in a discussion environment of work in progress than in a presentation of the results achieved.

Regardless of the context of the intervention, certain councils occupy an important place in the communicative system: the sobriety, the effectiveness of the communicative act and the clarity of the presentation. The logic of exchange during the oral communication process also involves a sharing of time and intimate space with other listeners. These spatiotemporal constraints should be considered as a factor in the development of a spirit of conviviality, altruism, sharing, common identity and harmony. Time and space for intervention are two elements to be taken into account in the preparation of the communication, which therefore requires adaptation, derivation and specification of the content of the intervention.

This stage of analysis and self-assessment of the form and substance of the process of oral scientific communication should therefore be approached in an abstinent manner with the main aim of advancing its own research work. The posture. "The researcher's profession" and the rigor of the scientist require attitudes and methods of preparation that put the focus on the balanced harmonization between the principles of efficacy of the art of rhetoric and the objective of the oral presentation expected. Likewise the manifestation of an attitude of manager of cross-communicative transactions; Self-esteem and acceptance of critical feedback, are part of socioconstructivist and socioprofessional logic and not in logic of identity (Individual called into question).

THANKS

This article is based on the transversal training program for doctoral students. We mobilize authors who, before us, proposed rules of oral presentation. As it is sometimes difficult to differentiate..... I will develop it later.

.

REFERENCES

1. Salmi, LR.**1998**. *Lecture critique et rédaction médicale scientifique. Comment lire, rédiger et publier une étude clinique ou épidémiologique.* .1998 ; *Paris: Elsevier.*
2. Williams CK. **1994**. Making effective presentations. In: Minick P, ed. Biomedical . communication: selected AMWA.Medical Writers *Maryland: American* ,workshops. Bethesda Association, 90-pp.84.
3. Browner, WS. **1990**. Publishing and presenting clinical research. Baltimore, Maryland: Lippincott Williams and Wilkins.
4. Smith R**. 2000.** How not to give a presentation , *Journal List,BMJ*, **321**(7276): 1570–1571.
5. Paul, Glover. **2008**. *Guide de communication scientifique orale*, 29 aout 2008.
6. Woolliscroft JO. **1991**. Enhance communication: avoid red and green in slides [letter]. N Engl J Med 1991; 325-740.

.